

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
Promoting Diversification of Ownership)	MB Docket No. 07-294
In the Broadcasting Services)	
)	
2006 Quadrennial Regulatory Review –)	MB Docket No. 06-121
Review of the Commission’s Broadcast)	
Ownership Rules and Other Rules Adopted)	
Pursuant to Section 202 of the)	
Telecommunications Act of 1996)	
)	MB Docket No. 02-277
2002 Biennial Regulatory Review – Review)	
of the Commission’s Broadcast Ownership)	
Rules and Other Rules Adopted Pursuant to)	
Section 202 of the Telecommunications Act)	
of 1996)	MM Docket No. 01-235
)	
Cross-Ownership of Broadcast Stations and)	
Newspapers)	MM Docket No. 01-317
)	
Rules and Policies Concerning Multiple)	
Ownership of Radio Broadcast Stations in)	MM Docket No. 00-244
Local Markets)	
)	MB Docket No. 04-228
Definition of Radio Markets)	
Ways to Further Section 257 Mandate and		
To Build on Earlier Studies		

In item #100 of this proceeding, (“Reallocation of TV Channels 5 and 6 for FM Service”) the Commission asks for comment on a proposal to reassign two TV channels for the expansion of the FM broadcasting band. This is an interesting proposal that has some merit, but also some technical challenges.

- Inadvisability of removal of spectrum from TV service:

I would suggest that it is far too late to remove 76-88MHz (channels 5 and 6) from TV service. Appendix B to FCC 08-72 lists 24 TV stations assigned post-transition facilities in these two channels. At least one station has filed a post-transition DTV plan which indicates a channel 5 DTV transmitter has already been ordered and is likely to be

delivered before the comment period in this proceeding ends. ¹

Removing these channels from TV service would delay transition by requiring these 24 stations to find new channels for their post-transition operation.

- In sixteen of these cases, requiring these stations to return to their analog channels does not solve the problem – because their analog channel is either 5 or 6.
- In two other cases, their analog channel is outside core.
- Remaining on their interim DTV channel is also often not an option.
 - In three cases, a station's post-transition assignment is channel 5 – and their interim assignment is channel 6, or vice-versa.
 - One station on each channel is too new to have received an interim DTV assignment; their 5/6 analog assignment is their only channel.
 - Four stations have interim assignments outside core.

So, reallocating channels 5 and 6 would require lengthy work to find new channels for 24 stations. And it would result in many of these stations being stuck with expensive equipment, already ordered, which they cannot use.

- Shared use of channels 5 and 6:

Channels 5 and 6 could be used on a shared basis. They could be used for FM in places where there would be no mutual interference with DTV stations in these channels. However, in this case the FM band could not be expanded at all in the New York and Chicago markets; both channels will be in post-transition use, either with full-power DTV stations or with LPTV or Class A stations. Among the other largest markets, only in San Francisco and Houston would channel 6 be available.

- Proposal: shared use of all low-band TV channels:

I propose that the entire 54-88MHz band² be assigned for radio, on a secondary basis to existing DTV, LPTV, and Class A service. (and on a co-primary basis to new TV stations)

Attached is a survey illustrating the availability of this spectrum in the ten largest U.S. markets. This table suggests that a channel 5/6 only solution would allow 12MHz for new FM service in one market (San Francisco); 6MHz in seven other markets; and no expansion in Chicago or New York. A full-band solution would allow at least 12MHz of spectrum in all ten markets; 18MHz in four markets; and 24 Mhz in three markets. Power might be limited in some markets, but sixteen new 50,000-watt FM stations could be possible in New York; thirty new 100,000-watt stations could be possible in Houston.

- Proposal: assign new spectrum for digital radio broadcasting:

¹ See BDTRCT-20080213ACE, the Form 387 filed by WTVF(DT), Nashville. It is unlikely that WTVF is the only station to have already ordered a DTV transmitter for channel 5/6 service.

² of course with the exception of the 72-76MHz aeronautical navigation band

The rollout of digital radio with the “IBOC”/ “HD Radio” system is stuck in a kind of “triangle of mutual exclusivity”:

1. Digital coverage is limited by the need to limit power to avoid mutual interference with the station's own analog signal.
2. This power limit could be lifted if the analog signal could be phased out. But the analog signal cannot be phased out until most listeners have digital receivers.
3. But listeners won't buy digital receivers if they can't receive a digital signal from their favorite stations in the locations where they normally travel.

On the AM band especially, there have been complaints of interference even at the limited powers currently used. Some stations that have tried digital broadcasting on the AM band have suspended digital operation, at least at night.

The 54-88MHz band would be an excellent place for digital radio. With no existing radio stations on adjacent channels to interfere with, and no existing analog service to protect from self-interference, digital stations in this band could launch as full-digital operations, at the same power levels currently used for analog service in the 88-108Mhz band. Coverage at least equal to that of analog FM radio could be obtained without interfering with existing service.

Also, since there would be no need to protect the analog signal in the center of the channel, additional digital bandwidth would be available which would allow for more subchannels.

“Reading between the lines” of the Mullaney Engineering, Inc. proposal, I believe channels 5 and 6 were selected because of their proximity to the existing 88-108MHz band. Some hobbyists have suggested that since FM radios currently sold in Japan already tune down to 76MHz, these receivers could simply be imported into the American market, providing a ready source of radios for a 76-88MHz band.

What is often missed is that the Japanese FM band ends at 90MHz. Japanese-market radios imported into the United States would tune only a small part of the existing FM band.³

So, use of any of the spectrum below 88MHz for radio broadcasting would require new receivers. If new equipment would be required anyway, this would be a good time to convert to digital operation.

– **Conclusion:**

- Expansion of radio broadcasting into TV spectrum below 88MHz is possible, even in America's largest cities.
- Expansion is possible without interfering with TV service or the DTV transition.
- The possibilities for expansion into only TV channels 5 and 6 are very limited.

³ these radios also tune the AM band in 9kHz steps – 531, 540, 549, 558, etc... - and thus would only properly receive one out of every ten U.S. AM frequencies.

- Expansion into all five channels in the 54-88MHz band provides much greater potential for additional FM service.
- As new receiver designs would be necessary in any case, the Commission should consider requiring digital operation in any expanded band.

Respectfully submitted,
Douglas E. Smith
1389 Old Clarksville Pike

Pleasant View, TN 37146-8098
dougw9wi@gmail.com

54-88MHz: Availability of channels for sharing by FM radio

The following table shows the potential availability of low-band (channels 2-6) TV channels for use by FM radio in the Top 10 television markets after the digital TV transition of February 2009.

Squares marked in gray are not available for FM service. Either a full-power DTV station⁴ exists within the zone proscribed by 73.610(b)(1)⁵, or a LPTV (or Class A) station⁶ exists whose 62dBu contour comes within 113km of the market's primary TV transmitter site⁷.

Squares marked in green are available for FM service without restriction. No full-power DTV station exists within the 73.610 proscribed zone, and no LPTV station exists whose 62dBu contour would be overlapped by the 34dBu (-28dB) contour of a maximum-power FM station⁹ at the primary transmitter site.

Squares marked in blue are available but at limited power. No full-power DTV station exists within the 73.610 proscribed zone, but one or more LPTV stations exist whose 62dBu contour would be overlapped by the 34dBu contour of a maximum-power FM station at the primary transmitter site. However, these LPTVs' 62dBu would not be overlapped by the 34dBu of a FM station of lower class, as indicated in the table. For example, a full Class C FM (100kw/600m) in Dallas' Cedar Hill antenna site would overlap with LPTV station KLUF-LP on channel 5 in Lufkin, Texas. However, a full Class C2 (50kw/150m) would not overlap with KLUF.

In each case, the station or stations that limit or prevent use of a channel are listed. Full-power stations are listed in **boldface**. -D indicates a digital low-power or Class A station.

⁴ Only post-transition DTV channels were considered. Presumably the February 2009 deadline will have passed before any FM stations can be authorized in 54-88MHz, so both full-power analog and interim pre-transition DTV channels will be off the air and not subject to FM interference.

⁵ This regulation establishes the minimum distance between full-power analog TV stations. The limit is 273km in Zone I (most top 10 markets); 305km in Zone II (Los Angeles, Dallas, San Francisco, and Atlanta), and 353km in Zone III. (Houston) This limit was considered reasonable for FM radio because the maximum power available for FM service is the same as that allowed for TV in Zones II and III. (and lower than that allowed in Zone I)

⁶ Both analog and digital LPTV and Class A stations were considered.

⁷ I defined the "primary transmitter site" as the average of the coordinates of the four analog TV stations affiliated with the ABC, CBS, Fox, and NBC networks, and the primary PBS-affiliated non-commercial station. In all ten markets these stations' transmitters are very close, within 5km. Presumably this would be the preferred antenna site for any new FM service as well.

⁸ 113km being the 34dBu contour of a maximum-facility Class A station. Regulation 74.707(a)(1)(I) establishes a protected contour of 62dBu for channel 2-6 analog LPTV stations, and 74.707(d)(1) establishes a 28dB protection ratio.

⁹ "Maximum power" is Class B facilities (50kw/150m) in most markets – Class C facilities (100kw/600m) in Dallas, Atlanta, and Houston.

City	2	3	4	5	6
New York	OK	WBQM, WBQM-D	OK	W05CS-D	WEDY, WRGB, WPVI
Los Angeles	Class A (K02HY, KCWQ, KTBV)	KVTU-D, K59AO-D	Class A (KVER, KTFB, K04HX, KVHF, KBAB-D)	Class A (KEVC, K05FO)	K61AJ-D, KCIO
Chicago	OK	OK	WHBF	WGVK	WLFM
Philadelphia	OK	Class A (WBQM)	Class A (WLWP)	Class A (W05BG, W05CS-D)	WPVI
Dallas/Ft. Worth	Class A (K02QH, K02EQ)	KHPK-D	OK	Class C2 (KLUF)	KZFW, KZFW- D, KBFW
San Francisco	KOTR	Class A (KMMD)	OK	Class A (K10OI)	Class A (K06DK, K06FA)
Boston	Class A (WVBK)	WTMU-D, WCEA	OK	OK	WEDY, WRGB
Atlanta	Class C2 (WBXA)	Class C2 (W03AK)	WUVM	Class C2 (WBXM, 5 xltrs)	WCES, WABW
Washington	OK	OK	Class A (WLWP)	Class A (WDOB)	WPVI
Houston	OK	OK	OK	KJIB ¹⁰	OK

The eventual end of analog LPTV/Class A service would open up more channels in this table. Specifically, channel 6 would become available without limit in Chicago; channel 2 in San Francisco; and channel 4 in Atlanta.

Adjacent-channel separations were not considered. Due to the much narrower bandwidth of a FM radio transmission, it should be possible to use most, if not all, of the channel adjacent to a local DTV station without observing the frequency separations applicable to TV service.

Also not considered was terrain obstruction. For example, the five TV translators that contribute to the restriction of the use of channel 5 in Atlanta are in the mountains of western North Carolina. It is likely that terrain would prevent an Atlanta FM station from interfering with these translators.

Directional antennas were not considered. In practice, the use of such antennas at many

¹⁰ KJIB-LP has applied to move to channel 29 and to establish a DTV facility on that channel. If implemented, channel 5 would be freed up for FM service at the Houston primary transmitter site.

TV stations may make FM operation practical in markets where this table suggests it's not possible.